

Mitral valve replacement for an annular submitral aneurysm of the left ventricle

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Abstract

Successful surgical repair of an annular submitral aneurysm of the left ventricle in two patients is described. In both cases the diagnosis was made at surgery and they were treated successfully by transatrial closure of the aneurysm with Teflon felted sutures and mitral valve replacement. This is the first report of the use of mitral valve replacement for this condition.

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Case 1

A 39 year old man presented with exertional dyspnoea and chest pain of three months' duration. He had heart failure (NYHA class III). His apex beat was in the left fifth intercostal space in the mid clavicular line and a grade IV pan systolic murmur was localised to the mitral area. There was cardiomegaly on the chest radiograph and left anterior hemiblock with poor R progression from VI-3 on the electrocardiogram.

Doppler echography revealed moderate mitral regurgitation with a prolapsing anterior mitral leaflet, probably due to ruptured chordae. Angiography showed severe mitral regurgitation. At surgery the heart was arrested on cardiopulmonary bypass with crystalloid cardioplegia. Left atriotomy revealed a submitral annular aneurysm (5 × 5 cm) occupying the upper halves of the anterior and posterior mitral leaflets and dissecting into the anterior leaflet. A single opening 2 × 1 cm was found behind the posterior mitral leaflet. The aneurysm was filled with clots. The posterior leaflet was stretched over the aneurysm and was adherent to it. The mitral valve was excised and the orifice of the aneurysm was closed with interrupted Teflon felted Ethibond mattress sutures followed by mitral valve replacement with a 3M Starr Edwards ball valve prosthesis. The patient is well 12 months after surgery.

Case 2

A 20 year old man presented with exertional dyspnoea of one year's duration (NYHA class III). He had a grade IV pan systolic murmur at the apex radiating into the axilla. Chest

radiography showed cardiomegaly with a localised bulge over the left cardiac border (fig) and the electrocardiogram showed right axis deviation, deep Q waves in lead I and AVL, left ventricular hypertrophy, and lateral wall T wave changes. The deep Q waves suggested lateral wall infarction which was thought to be unlikely in view of his age. Severe mitral regurgitation was seen on Doppler echography. The clinical diagnosis was mitral regurgitation, probably of rheumatic origin, so he underwent surgery. He had an annular submitral aneurysm (5 × 4 cm) extending to the posterolateral surface of the left ventricle. The aneurysm was filled with clot and had a 3 × 1 cm opening into the left ventricle behind the posterior mitral leaflet. The posterior mitral leaflet was tethered to and stretched by the aneurysm resulting in mitral regurgitation.

Excision of the mitral valve was followed by transatrial closure of the orifice with interrupted 2/0 Teflon felted mattress sutures. The mitral valve was replaced with a No 25 monostrut Bjork-Shiley valve. The patient is well two months after surgery.

Discussion

Annular submitral aneurysm is rare and has been reported predominantly among black subjects in South Africa¹⁻⁴ and the USA.⁵ A few cases have been reported in caucasians⁶ and Asians.⁷ The majority of cases reported in the literature were diagnosed at necropsy.^{1,8-10} A few reports of successful repair have been published from South Africa,²⁻⁴ Japan,^{7,11} USA,⁵ and the UK.⁶

Although many criteria for the preoperative diagnosis of this condition have been suggested,¹ the diagnosis in both our cases was made at surgery. In the first case the aneurysm was not outlined by the left ventric-

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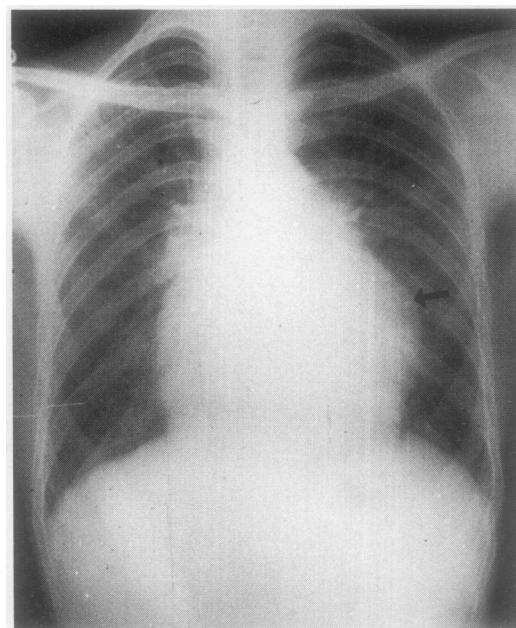
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Annular submitral aneurysm of left ventricle.

ular angiogram as it was filled with clots. In the second case an angiogram was not done and the aneurysm was overlooked on the pre-operative ultrasound examination but was clearly delineated after the operation. Because of our previous experience with a similar case diagnosed at necropsy,⁹ the condition was recognised and treated. In retrospect, an abnormal chest radiograph, an electrocardiogram with signs of ischaemia, and a careful echocardiogram in a young patient with pure mitral regurgitation should lead to the diagnosis.

The approach for surgical repair is controversial as these patients may have multiple openings or even multiple aneurysms. Approaches through a left ventriculotomy¹ or the floor of the left atrium have been described.

In all the published reports of successful repair of these aneurysms the mitral valve has been conserved, sometimes with mitral annuloplasty. In both of our cases the diagnosis was made at surgery and the posterior mitral leaflet was densely adherent to the aneurysm. Because of this, and because the annulus was very distorted by the aneurysm, the leaflets were excised which permitted good visualisation for closure of the opening of the aneurysm. Although we cannot be sure that the native valve could not have been pre-

served, we feel that a prosthetic valve in this situation may be advantageous in that it further strengthens the repair by buttressing the closure of the opening by a rigid annulus ring. This may prevent recurrence of the aneurysm and also reoperation for residual mitral regurgitation following a mitral annuloplasty.

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